



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

JUN 21 2013

Herschel T. Vinyard  
Secretary  
Florida Department of Environmental Protection  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

Dear Secretary Vinyard:

The U. S. Environmental Protection Agency has completed its review of the site specific alternative criteria (SSAC) for total phosphorus (TP) for the Upper St. Johns River (USJR). The Florida Department of Environmental Protection (FDEP) submitted revised Chapter 62-302, including the SSAC, to the EPA on June 13, 2012 as new or revised water quality standards with the necessary certification by the FDEP general counsel, pursuant to 40 CFR Part 131. The SSAC were included in the list of site specific numeric interpretations of paragraph 62-302.530(47)(b), Florida Administrative Code (F.A.C.), referenced in paragraph 62-302.531(2)(a), F.A.C., and published at the FDEP's website at <http://www.dep.state.fl.us/water/wqssp/swq-docs.htm>. FDEP submitted the numeric interpretations of the state narrative nutrient criterion for WBIDs 2893L, 2893Q, and 2893X expressed in the USJR Total Maximum Daily Load report as the SSAC. FDEP intends for these SSAC to serve as the numeric nutrient criteria for TP for USJR in place of the otherwise applicable TP criteria set out in paragraphs 62-302.531(2)(c) and 62-302.531(2)(b)1., F.A.C.

In accordance with section 303(c) of the Clean Water Act, I am hereby approving the SSAC for the USJR as revised water quality standards for TP. Any other criteria applicable to this waterbody remain in effect, including other applicable criteria at 62-302.531(2)(c) and 62-302.531(2)(b)1., F.A.C. and any applicable federal criteria at 40 CFR Part 131.43(c)(1). The requirements of paragraph 62-302.530(47)(a), F.A.C. also remain applicable. The details of the SSAC are discussed in the enclosed documentation. We would like to commend you and your staff for your continued efforts in environmental protection for the State of Florida.

If you have any questions regarding the EPA's approval, please contact me at (404) 562-9345 or have a member of your staff contact Ms. Annie M. Godfrey, Water Quality Standards Section Chief at (404) 562-9967.

Sincerely,

A handwritten signature in black ink, appearing to read "J. D. Giattina".

James D. Giattina  
Director  
Water Protection Division

Enclosure

cc: Thomas M. Beason, FDEP  
Daryll Joyner, FDEP

**Decision Document for Hierarchy 1 Site Specific Alternative Criterion  
for Upper St. Johns River (USJR)**

Summary Information

| <b>WBID</b> | <b>Description</b>          | <b>Class</b>              | <b>Waterbody Type</b><br><i>Impaired Waters<br/>Rule (IWR) Run 40</i> | <b>Listing Parameter</b>  |
|-------------|-----------------------------|---------------------------|---|---|
| 2893L       | USJR above Lake<br>Poinsett | Class III<br>(freshwater) | Stream  | Nutrients<br>(Chlorophyll- <i>a</i> (chl- <i>a</i> )<br>and dissolved oxygen<br>(DO)) |

A nutrient and DO Total Maximum Daily Load (TMDL) for USJR WBID 2893L was developed by the Florida Department of Environmental Protection (FDEP) and approved by the Environmental Protection Agency on January 3, 2007, pursuant to section 303(d) of the Clean Water Act (CWA). This TMDL was developed to identify the level of nutrients that would prevent an imbalance of flora and fauna as required by the state's narrative nutrient criterion at paragraph 62-302.530(47)(b), Florida Administrative Code (F.A.C.). FDEP determined that a total phosphorus (TP) load of 89 tons/yr, not to be exceeded as an annual load, would meet its narrative criterion and adopted that load as a TMDL value at subsection 62-304.510(1), F.A.C. FDEP has submitted the TP load from the TMDL for EPA review as a hierarchy 1 site specific alternative nutrient criterion (SSAC) for TP for the USJR WBID 2893L, pursuant to section 303(c) of the CWA and EPA's implementing regulations at 40 CFR Part 131. This decision document approves the SSAC for TP of 89 tons/yr, not to be exceeded as an annual load, as a hierarchy 1 criterion for USJR WBID 2893L. Any other criteria applicable to this waterbody remain in effect. Specifically as to nutrients, total nitrogen criteria consistent with paragraph 62-302.531(2)(c), F.A.C. continue to apply, as well as the requirements of paragraph 62-302.530(47)(a), F.A.C.

In a letter dated June 13, 2012, from Thomas M. Beason, General Counsel for FDEP, to Gwendolyn Keyes Fleming, Regional Administrator of the EPA's Region 4 Office, FDEP submitted the numeric interpretation of the state narrative nutrient criterion for TP for the USJR WBID 2893L as expressed in the USJR TMDL as the SSAC for the USJR WBID 2893L. This SSAC serves as a primary site specific interpretation of Florida's narrative water quality criterion for nutrients set out in paragraph 62-302.530(47)(b), F.A.C. in accordance with paragraph 62-302.531(2)(a), F.A.C. Pursuant to section 303(c) of the CWA, this revised water quality standard is subject to review and approval by the EPA since FDEP intends for this SSAC to serve as a numeric nutrient criterion for TP for USJR in the place of the otherwise applicable TP criterion set out in paragraph 62-302.531(2)(c), F.A.C. In the June 13, 2012, letter, the FDEP General Counsel certified that the revised water quality standards were duly adopted pursuant to Florida law.

The EPA's decision to approve this criterion is subject to the results of consultation under section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service. By approving the standards "subject to the results of consultation," the EPA retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial

action by the EPA. The EPA will notify FDEP of the results of the section 7 consultation upon completion of the action.

#### Description of waters for which a SSAC has been proposed

The TMDL which forms the basis for this SSAC addresses three waterbodies that are segments of the USJR, which flows from south to north and drains a watershed area of about 1,209,000 acres (see map on page 4). Sheet flow dominates the first 30 miles of the headwater area, after which the river reaches a channel at the Three Forks Marsh area and flows northward for about 90 miles. The river flows through seven major lakes including Lake Hell n' Blazes, Little Sawgrass Lake, Sawgrass Lake, Lake Washington, Lake Winder, Lake Poinsett, and Puzzle Lake. The conversion of the flood plain in the USJR basin from wetlands to agricultural and urban land uses has altered the natural hydrology of the region and associated pollutant loading from these converted areas affected water quality in the basin. WBID 2893L is a Class III (freshwater) waterbody, with designated uses of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife.

#### Discussion of how the load was derived

WBID 2893L was verified as impaired for nutrients and DO based on assessment methodologies identified in Florida's Impaired Waters Rule (IWR) at Chapter 62-303, F.A.C. Consequently, WBID 2893L was added to the verified list of impaired waters by Secretarial Order on June 17, 2005. The nutrient impairment was based on the exceedance of the 5-year average historical minimum chl-*a* concentration of 6.1 µg/L (based on data from 1981 through 1985) by more than 50 percent in two consecutive years (2000 and 2001). The DO impairment was based on 51 out of 93 DO measurements being lower than the state water quality criterion of 5 mg/L. FDEP identified nutrients and Biochemical Oxygen Demand (BOD) as the causative pollutants for the low DO observations.

To address the nutrient and DO impairments in WBID 2893L, FDEP developed a TMDL dated April 25, 2005, which was approved by EPA on January 3, 2007. The Nutrient and DO TMDL for the St. Johns River above Lake Poinsett WBID 2893L adopted at 62-304.510(1) was a TP loading of 89 tons/yr, not to be exceeded as an annual load.

FDEP found that the distribution of DO and BOD throughout the USJR basin and the inverse relationship between DO and TP suggest that anthropogenic BOD and phosphorus are at least partial contributors to the system's low DO concentrations and consequential impaired status. As a result of these analyses, FDEP calculated explicit TMDL TP and BOD loads for these waterbodies.

The TMDL utilized TP and DO as target parameters, with an additional BOD target for WBIDs 2893L and 2893X. The TP target concentration of 0.09 mg/L used in this TMDL was based upon the target TP concentration established for the river channel and chain of lakes in the USJR basin by the St. Johns River Water Management District (SJRWMD). This TP target was set at a level above which total biovolume of blue-green algae substantially increased. Such increased levels of blue-green algae indicate imbalance in flora and fauna. SJRWMD determined that a blue-green algae-based TP target was superior to both chl-*a* and Trophic State Index (TSI) as indicators of the nutrient target because the algae based target is more sensitive and therefore

allows a higher level of protection. According to SJRWMD, blue-green algal blooms could occur in USRJ before a chl-*a* based indicator would detect them.

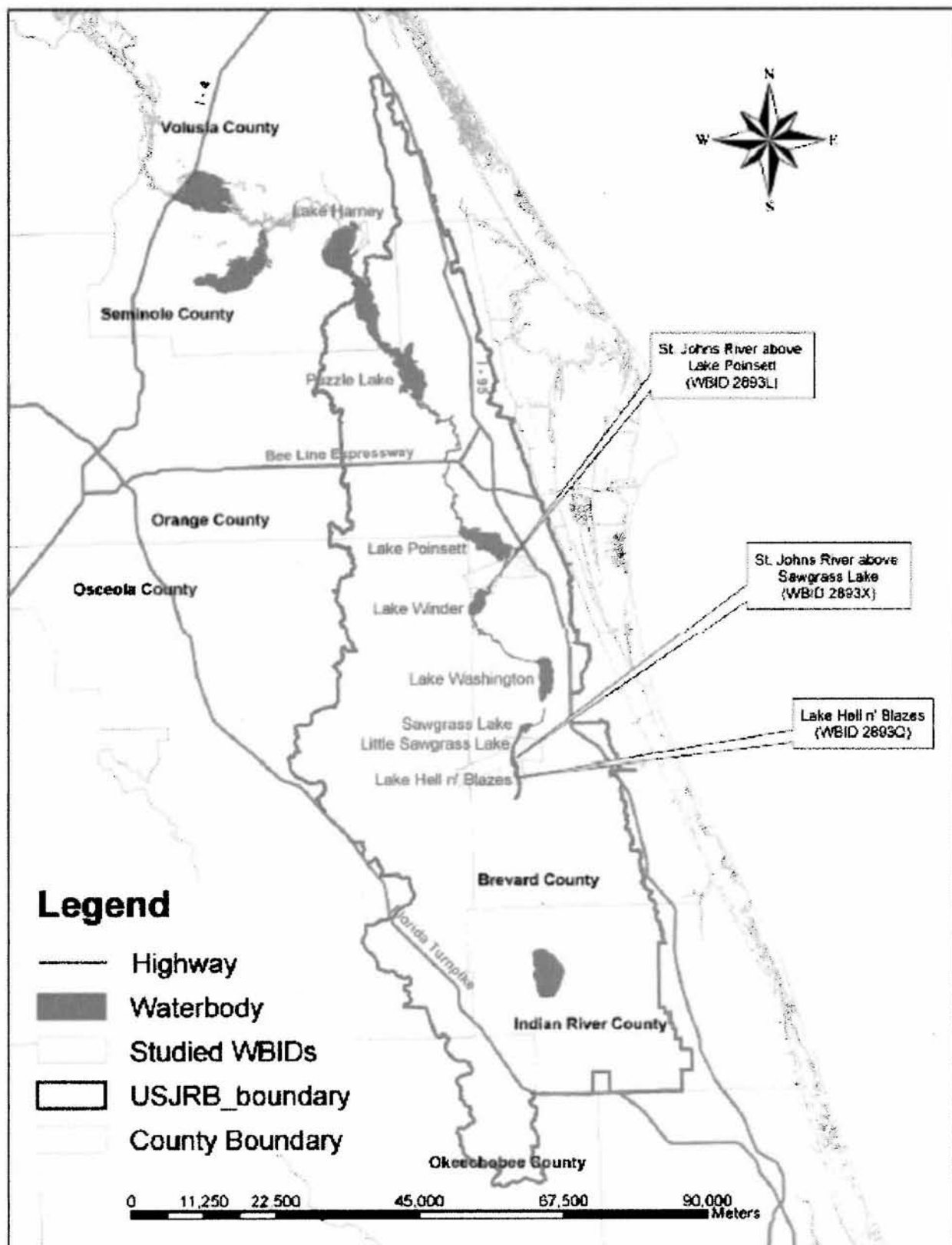
To determine the annual TP load of the TMDL, FDEP calculated TP and BOD existing loads. Monthly TP loadings to these WBIDs were calculated by multiplying monthly TP concentrations by average monthly flows. These monthly loads were calculated for different years from 1995 through 2002, then aggregated first by month to represent long-term monthly loads, then overall to calculate long-term annual TP loads for each WBID.

#### Consideration of TMDL load as a new or revised water quality standard

The TMDL load for the St. Johns River above Lake Poinsett of 89 tons/yr of TP correlated to a TP concentration of 0.09 mg/L. This TP concentration was based upon the concentration established for the river channel and chain of lakes in the USJR basin by the SJRWMD which would maintain a balance of flora and fauna and prevent an unbalanced increase of total blue-green algae.

#### Conclusion

Based on the chemical, physical and biological data presented in the development of the SSAC, the EPA concludes that the SSAC for TP established for the USJR WBID 2893L protects healthy, well-balanced biological communities in the waters to which the SSAC applies and is consistent with the CWA and its implementing regulations. More specifically, the SSAC is consistent with both 40 CFR Part 131.11(b)(1)(ii), and the EPA's 304(a) guidance on nutrient criteria. The TP SSAC for St. Johns River above Lake Poinsett WBID 2893L which provides for TP loading of 89 tons/yr will protect water quality and aquatic life. FDEP did not address downstream protection in this TMDL. Paragraph 62-302.531(4) will apply to this WBID in conjunction with the Hierarchy 1 SSAC to ensure attainment and maintenance of water quality standards of downstream waters, in accordance with 40 CFR Part 131.10. In accordance with section 303(c) of the CWA, the SSAC for the St. Johns River above Lake Poinsett for TP loading of 89 tons/yr, not to be exceeded as an annual load, is hereby approved as consistent with the CWA and 40 CFR Part 131.



Overview of waters included in this TMDL (p. 2, Figure 1.1)

**Appendix 1 – Summary of the TMDL Background**

|   |   |
|---|---|
| <b>Name(s) of Addressed Water(s)</b>  | St. Johns River above Lake Poinsett   |
| <b>Waterbody Type(s)</b>  | Stream (IWR Run 40)   |
| <b>WBIDs</b>  | 2893L   |
| <b>Latitude/Longitude</b>   | NA.   |
| <b>Description</b>  | Segment of the Upper St. Johns River. The USJR basin extends from the southern boundary of Indian River County and the middle of Okeechobee County in the south to the confluence with the Econlockhatchee River near Lake Harney (Seminole County) in the north and southeast part of Volusia County in the northeast. The USJR flows from south to north and drains a watershed area of about 1,209,000 acres. The movement of the water in the first 30 miles (headwater area) of the river is dominated by sheet flow until reaching the discernible channel at the Three Forks Marsh area. The river then flows northward through about 90 miles of river channel and seven major lakes including Lake Hell n' Blazes, Little Sawgrass Lake, Sawgrass Lake, Lake Washington, Lake Winder, Lake Poinsett, and Puzzle Lake (TMDL p. 1). WBID 2893L is in northern Brevard County several miles downstream of WBIDs 2893Q and 2893X to the south (TMDL p. 2). |
| <b>Classification(s)</b>  | Class III (freshwater) (TMDL p. 12)   |
| <b>Basin</b>  | Upper St. Johns River (TMDL p. 1)   |
| <b>Date Placed on Verified List</b>   | June 17, 2005 (TMDL, p. 1)  |
| <b>Date TMDL was approved by EPA</b>  | January 3, 2007 (EPA WATERS database query 6/4/12)  |
| <b>Reference Streams/Lakes</b>  | NA.   |
| <b>Source of Majority of Flow</b>   | Not specified, part of USJR system. The long-term average flow for WBID 2893L was estimated to be 800,173 acre-ft-yr (TMDL p. 34).  |
| <b>Indicators</b>   | Total biovolume of blue-green algae substantially increased when the TP concentration was greater than 0.09 mg/L. The increase of blue-green algae in the phytoplankton community can significantly disrupt the normal functions of phytoplankton communities, which leads to an imbalance of aquatic flora and fauna (TMDL p. 12, 13, 24).   |
| <b>Identification of Causative Pollutants (as determined by measurements of response endpoints or indicators)</b> | The causative pollutants for low DO observations in WBID 2893L were identified as nutrients and BOD (TMDL p. 5, 7). Median BOD concentrations in WBID 2893L (2.9 mg/L) were higher than 2.0 mg/L, which is the screening level used by FDEP, and was therefore considered by FDEP as one of the causative pollutants for the low DO condition (TMDL p. 20).   |

|  |   |  |  |
|--|---|--|--|
| <b>Sources and Concentrations of Nutrient Enrichment</b> | <p>The majority of TP and BOD loadings to the USJR basin come from nonpoint sources including surface runoff, groundwater input, nutrient sediment release, and atmospheric deposition. Agriculture is the dominant land use, at 43 percent of the overall area of the basin, followed by wetlands at 29 percent (TMDL p. 27). It was estimated that surface runoff from agricultural lands accounts for 73.4 percent of the total contributions from surface runoff (TMDL p. 30).</p> <p>Eight NPDES permitted facilities discharge in the parts of the USJR basin that discharge to the three WBIDs covered by this TMDL. Of these eight, the only facility discharging significant TP and BOD loading is the BCUD/South Central Regional WWTF with a 2.5 MGD permitted discharge from a created wetland to the 4-mile Canal to Lake Winder to St. Johns River. However TP and BOD loadings from this facility are negligible (TP 0.010 tons/yr and BOD 0.472 tons/yr) compared to total existing loads into WBID 2893L of TP 140 tons/yr (data from 1995-2002) and BOD 2,964 tons/yr (data from 2003) (TMDL p. 25-26).</p> <p>Within the USJR basin Municipal Separate Storm Sewer Systems (MS4) Phase I permit holders include Seminole County, Orange County, and Department of Transportation within Seminole and Orange County. Other counties within the basin have Phase II MS4 permits including Volusia, Osceola, Brevard, Indian River, Okeechobee counties (TMDL p. 27).</p> |  |  |
| <b>Nutrient Watershed Region in Proposed 62.302</b>      | Peninsular Stream (IWR Run 40)  |  |  |
| <b>Proposed Nitrogen SSAC and Frequency</b>              | NA.   |  |  |
| <b>Proposed Phosphorus SSAC and Frequency</b>            | 89 tons/yr annual load in WBID 2893L (TMDL p. 35, 38).  |  |  |
| <b>Biological Index Score(s) (e.g., SCI, TSI, IBI)</b>   | NA.   |  |  |

**Decision Document for Hierarchy 1 Site Specific Alternative Criterion  
for Upper St. Johns River (USJR)**

Summary Information

| <b>WBID</b> | <b>Description</b>  | <b>Class</b> | <b>Waterbody Type</b><br><i>Impaired Waters<br/>Rule (IWR) Run 40</i> | <b>Listing Parameter</b>   |
|-------------|---------------------|--------------|---|--|
| 2893Q       | Lake Hell n' Blazes | Class I      | Lake  | Nutrients<br>(Trophic State Index<br>(TSI) and dissolved<br>oxygen (DO)) |

A nutrient and DO Total Maximum Daily Load (TMDL) for USJR WBID 2893Q was developed by the Florida Department of Environmental Protection (FDEP) and approved by the Environmental Protection Agency on January 3, 2007, pursuant to section 303(d) of the Clean Water Act (CWA). This TMDL was developed to identify the level of nutrients that would prevent an imbalance of flora and fauna as required by the state's narrative nutrient criterion at paragraph 62-302.530(47)(b), Florida Administrative Code (F.A.C). FDEP determined that a total phosphorus (TP) load of 44 tons/year (yr), not to be exceeded as an annual load, would meet its narrative criterion and adopted that load as a TMDL value at subsection 62-304.510(2), F.A.C. FDEP has submitted the TP load from the TMDL for EPA review as a hierarchy 1 site specific alternative nutrient criterion (SSAC) for the USJR WBID 2893Q, pursuant to section 303(c) of the CWA and EPA's implementing regulations at 40 CFR Part 131. This decision document approves the SSAC for TP of 44 tons/yr, not to be exceeded as an annual load, as a hierarchy 1 criterion for USJR WBID 2893Q. Any other criteria applicable to this waterbody remain in effect. Specifically as to nutrients, total nitrogen and chlorophyll *a* criteria consistent with paragraph 62-302.531(2)(b)1., F.A.C. continue to apply, as well as the requirements of paragraph 62-302.530(47)(a), F.A.C.

In a letter dated June 13, 2012, from Thomas M. Beason, General Counsel for FDEP, to Gwendolyn Keyes Fleming, Regional Administrator of the EPA's Region 4 Office, FDEP submitted the numeric interpretation of the state narrative nutrient criterion as expressed in the USJR WBID 2893Q TMDL as the SSAC for the USJR WBID 2893Q. This SSAC serves as a primary site specific interpretation of Florida's narrative water quality criterion for nutrients set out in paragraph 62-302.530(47)(b), F.A.C., in accordance with paragraph 62-302.531(2)(a), F.A.C. Pursuant to section 303(c) of the CWA, this revised water quality standard is subject to review and approval by the EPA since FDEP intends for this SSAC to serve as a numeric nutrient criterion for TP for USJR in the place of the otherwise applicable TP criterion set out in paragraph 62-302.531(2)(c), F.A.C. In the June 13, 2012, letter, the FDEP General Counsel certified that the revised water quality standards were duly adopted pursuant to Florida law.

The EPA's decision to approve this criterion is subject to the results of consultation under section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service. By approving the standards "subject to the results of consultation," the EPA retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial



action by the EPA. The EPA will notify FDEP of the results of the section 7 consultation upon completion of the action.

#### Description of waters for which a SSAC has been proposed

The TMDL which forms the basis for this SSAC addresses three waterbodies that are segments of the USJR, which flows from south to north and drains a watershed area of about 1,209,000 acres (see map on page 4). Sheet flow dominates the first 30 miles of the headwater area, after which the river reaches a channel at the Three Forks Marsh area and flows northward for about 90 miles. The river flows through seven major lakes including Lake Hell n' Blazes, Little Sawgrass Lake, Sawgrass Lake, Lake Washington, Lake Winder, Lake Poinsett, and Puzzle Lake. The conversion of the flood plain in the USJR basin from wetlands to agricultural and urban land uses has altered the natural hydrology of the region and associated pollutant loading from these converted areas affected water quality in the basin. WBID 2893Q is a Class I waterbody, with a designated use of potable water supplies.

#### Discussion of how the load was derived

WBID 2893Q was verified as impaired for nutrients and DO based on assessment methodologies identified in Florida's IWR at Chapter 62-303, F.A.C. Consequently, WBID 2893Q was added to the verified list of impaired waters by Secretarial Order on June 17, 2005. The nutrient impairment was based on the exceedance of the annual average TSI threshold of 60 for high colored lakes in 1998 and 1999. The TSI is a composite measurement used in evaluating the level of nutrient enrichment in lakes and estuaries. DO was verified as impaired based on 63 of the 81 DO measurements being below the 5.0 mg/L state water quality criterion. FDEP identified nutrients as the causative pollutant for the observed exceedances. To address the nutrient and DO impairments in WBID 2893Q, FDEP developed a TMDL dated April 25, 2005, which was approved by EPA on January 3, 2007. The Nutrient and DO TMDL for Lake Hell n' Blazes WBID 2893Q, adopted at 62-304.510(2), was a TP loading of 44 tons/yr, not to be exceeded as an annual load.

FDEP found that the distribution of DO and Biochemical Oxygen Demand (BOD) throughout the USJR basin and the inverse relationship between DO and TP suggest that anthropogenic BOD and phosphorus are at least partial contributors to the system's low DO concentrations and consequential impaired status. As a result of these analyses, FDEP calculated explicit TMDL TP and BOD loads for these waterbodies.

The TMDL utilized TP and DO as target parameters, with an additional BOD target for WBIDs 2893L and 2893X. The TP target concentration of 0.09 mg/L used in this TMDL was based upon the target TP concentration established for the river channel and chain of lakes in the USJR basin by the St. Johns River Water Management District (SJRWMD). Such increased levels of blue-green algae indicate imbalance in flora and fauna. SJRWMD determined that a blue-green algae-based TP target was superior to both chlorophyll-*a* (chl-*a*) and TSI as indicators of the nutrient target because the algae-based target is more sensitive and therefore allows a higher level of protection. According to SJRWMD, blue-green algal blooms could occur in USRJ before chl-*a* levels would detect them.

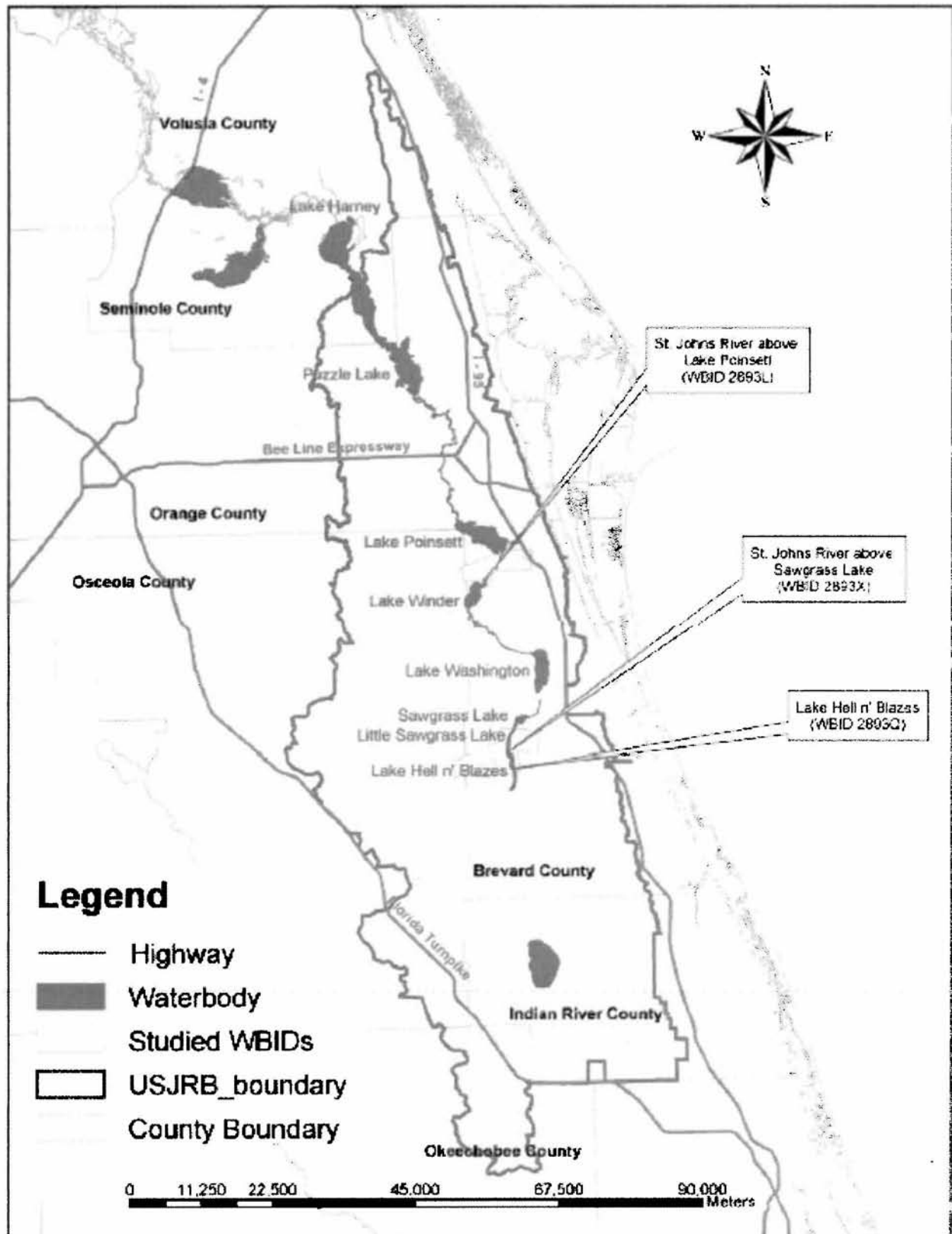
To determine the annual TP load of the TMDL, FDEP calculated TP and BOD existing loads. Monthly TP loadings to these WBIDs were calculated by multiplying monthly TP concentrations by average monthly flows. These monthly loads were calculated for different years from 1995 through 2002, then aggregated first by month to represent long-term monthly loads, then overall to calculate long-term annual TP loads for each WBID.

#### Consideration of TMDL load as a new or revised water quality standard

The TMDL load for Lake Hell n' Blazes of 44 tons/yr of TP correlated to a TP concentration of 0.09 mg/L. This TP concentration was based upon the concentration established for the river channel and chain of lakes in the USJR basin by SJRWMD which would maintain a balance of flora and fauna and prevent an unbalanced increase of total blue-green algae.

#### Conclusion

Based on the chemical, physical and biological data presented in the development of the SSAC, the EPA concludes that the SSAC for TP established for the USJR WBID 2893Q protects healthy, well-balanced biological communities in the waters to which the SSAC applies and is consistent with the CWA and its implementing regulations. More specifically, the SSAC is consistent with both 40 CFR Part 131.11(b)(1)(ii), and the EPA's 304(a) guidance on nutrient criteria. The TP SSAC for Lake Hell n' Blazes WBID 2893Q which provides for TP loading of 44 tons/yr, will protect water quality and aquatic life. FDEP did not address downstream protection in this TMDL. Paragraph 62-302.531(4) will apply to this WBID in conjunction with the Hierarchy 1 SSAC to ensure attainment and maintenance of water quality standards of downstream waters, in accordance with 40 CFR Part 131.10. In accordance with section 303(c) of the CWA, the SSAC for Lake Hell n' Blazes for TP loading of 44 tons/yr, not to be exceeded as an annual load, is hereby approved as consistent with the CWA and 40 CFR Part 131.



Overview of waters included in this TMDL (p. 2, Figure 1.1)

### Appendix 1 – Summary of the TMDL Background

|   |  |
|---|--|
| <b>Name(s) of Addressed Water(s)</b>  | Lake Hell n' Blazes  |
| <b>Waterbody Type(s)</b>  | Lake (IWR Run 40)  |
| <b>WBIDs</b>  | 2893Q  |
| <b>Latitude/Longitude</b>   | NA.  |
| <b>Description</b>  | Segment of the USJR. The USJR basin extends from the southern boundary of Indian River County and the middle of Okeechobee County in the south to the confluence with the Econlockhatchee River near Lake Harney (Seminole County) in the north and southeast part of Volusia County in the northeast. The USJR flows from south to north and drains a watershed area of about 1,209,000 acres. The movement of the water in the first 30 miles (headwater area) of the river is dominated by sheet flow until reaching the discernible channel at the Three Forks Marsh area. The river then flows northward through about 90 miles of river channel and seven major lakes including Lake Hell n' Blazes, Little Sawgrass Lake, Sawgrass Lake, Lake Washington, Lake Winder, Lake Poinsett, and Puzzle Lake (TMDL p. 1). WBID 2893Q is in Brevard County with WBID 2893X immediately downstream of this segment to the north (TMDL p. 2). |
| <b>Classification(s)</b>  | Class III (freshwater) (TMDL p. 12)  |
| <b>Basin</b>  | Upper St. Johns River (TMDL p. 1)  |
| <b>Date Placed on Verified List</b>   | June 17, 2005 (TMDL, p. 1)   |
| <b>Date TMDL was approved by EPA</b>  | January 3, 2007 (EPA WATERS database query 6/4/12)   |
| <b>Reference Streams/Lakes</b>  | NA.  |
| <b>Source of Majority of Flow</b>   | Not specified, part of USJR system. The long-term average flow for WBID 2893Q was estimated to be 400,578 acre-ft-yr (TMDL p. 34).   |
| <b>Indicators</b>   | Total biovolume of blue-green algae substantially increased when the TP concentration was greater than 0.09 mg/L. The increase of blue-green algae in the phytoplankton community can significantly disrupt the normal functions of phytoplankton communities, which leads to an imbalance of aquatic flora and fauna (TMDL p. 12, 13, 24).  |
| <b>Identification of Causative Pollutants (as determined by measurements of response endpoints or indicators)</b> | <p>The causative pollutant for low DO observations was identified as nutrients in WBID 2893Q (TMDL p. 5, 7).</p> <p>The TN/TP ratio was between 10 and 30, in most cases just slightly higher than 10, indicating TN/TP co-limitation or communities more limited by nitrogen than phosphorus. FDEP suggests that reductions in phosphorus input will return community to a TP</p>   |

|  |  |  |  |
|--|--|--|--|
|  | limited community and also reduce nitrogen loading throughout the USJR basin (TMDL p. 13).   |  |  |
| <b>Sources and Concentrations of Nutrient Enrichment</b> | <p>The majority of TP and BOD loadings to the USJR basin come from nonpoint sources including surface runoff, groundwater input, nutrient sediment release, and atmospheric deposition. Agriculture is the dominant land use, at 43 percent of the overall area of the basin, followed by wetlands at 29 percent (TMDL p. 27). It was estimated that surface runoff from agricultural lands accounts for 73.4 percent of the total contributions from surface runoff (TMDL p. 30).</p> <p>Eight NPDES permitted facilities discharge in the parts of the USJR basin that discharge to the three WBIDs covered by this TMDL. Of these eight, the only facility discharging significant TP and BOD loading is the BCUD/South Central Regional WWTF, but it is located downstream of WBID 2893Q and does not impact this WBID (TMDL p. 26).</p> <p>Within the USJR basin Municipal Separate Storm Sewer Systems (MS4) Phase I permit holders include Seminole County, Orange County, and Department of Transportation within Seminole and Orange County. Other counties within the basin have Phase II MS4 permits including Volusia, Osceola, Brevard, Indian River, Okeechobee counties (TMDL p. 27).</p> |  |  |
| <b>Nutrient Watershed Region in Proposed 62.302</b>      | Peninsular Lake (Color > 40 Platinum Cobalt Unit) (IWR Run 40, TMDL p. 23)   |  |  |
| <b>Proposed Nitrogen SSAC and Frequency</b>              | NA.  |  |  |
| <b>Proposed Phosphorus SSAC and Frequency</b>            | 44 tons/yr annual load WBID 2893Q (TMDL p. 35, 38).  |  |  |
| <b>Biological Index Score(s) (e.g., SCI, TSI, IBI)</b>   | Exceeded annual TSI of 60 in 1998 and 1999 (TMDL p. 5-6).  |  |  |

**Decision Document for Hierarchy 1 Site Specific Alternative Criterion  
for Upper St. Johns River (USJR)**

Summary Information

| <b>WBID</b> | <b>Description</b>                     | <b>Class</b> | <b>Waterbody Type</b><br><i>Impaired Waters<br/>Rule (IWR) Run 40</i> | <b>Listing Parameter</b> |
|-------------|--|--------------|---|--------------------------|
| 2893X       | St. Johns River above<br>Sawgrass Lake | Class I      | Stream  | Dissolved oxygen (DO)    |

A nutrient and DO Total Maximum Daily Load (TMDL) for USJR WBID 2893X was developed by the Florida Department of Environmental Protection (FDEP) and approved by the Environmental Protection Agency on January 3, 2007, pursuant to section 303(d) of the Clean Water Act (CWA). This TMDL was developed to identify the level of nutrients that would prevent an imbalance of flora and fauna as required by the state's narrative nutrient criterion at paragraph 62-302.530(47)(b), Florida Administrative Code (F.A.C). FDEP determined that a total phosphorus (TP) load of 57 tons/year (yr), not to be exceeded as an annual load, would meet its narrative criterion and adopted that load as a TMDL value at subsection 62-304.510(3), F.A.C. FDEP has submitted the TP load from the TMDL for EPA review as a hierarchy 1 site specific alternative nutrient criterion (SSAC) for TP for the USJR WBID 2893X, pursuant to section 303(c) of the CWA and EPA's implementing regulations at 40 CFR Part 131. This decision document approves the SSAC for TP of 57 tons/yr, not to be exceeded as an annual load, as a hierarchy 1 criterion for USJR WBID 2893X. Any other criteria applicable to this waterbody remain in effect. Specifically as to nutrients, total nitrogen criteria consistent with paragraph 62-302.531(2)(c), F.A.C. continue to apply, as well as the requirements of paragraph 62-302.530(47)(a), F.A.C.

In a letter dated June 13, 2012, from Thomas M. Beason, General Counsel for FDEP, to Gwendolyn Keyes Fleming, Regional Administrator of the EPA's Region 4 Office, FDEP submitted the numeric interpretation of the state narrative nutrient criterion for the USJR WBID 2893X as expressed in the USJR TMDL as the SSAC for TP for the USJR WBID 2893X. This SSAC serves as a primary site specific interpretation of Florida's narrative water quality criterion for nutrients set out in paragraph 62-302.530(47)(b), F.A.C., in accordance with paragraph 62-302.531(2)(a), F.A.C. Pursuant to section 303(c) of the CWA, this revised water quality standard is subject to review and approval by the EPA since FDEP intends for this SSAC to serve as a numeric nutrient criterion for TP for USJR in the place of the otherwise applicable criterion set out in paragraph 62-302.531(2)(c), F.A.C. In the June 13, 2012, letter, the FDEP General Counsel certified that the revised water quality standards were duly adopted pursuant to Florida law.

The EPA's decision to approve this criterion is subject to the results of consultation under section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service. By approving the standards "subject to the results of consultation," the EPA retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial action by the EPA. The EPA will notify FDEP of the results of the section 7 consultation upon completion of the action.

#### Description of waters for which a SSAC has been proposed

The TMDL which forms the basis of this SSAC addresses three waterbodies that are segments of the USJR, which flows from south to north and drains a watershed area of about 1,209,000 acres (see map on page 4). Sheet flow dominates the first 30 miles of the headwater area, after which the river reaches a channel at the Three Forks Marsh area and flows northward for about 90 miles. The river flows through seven major lakes including Lake Hell n' Blazes, Little Sawgrass Lake, Sawgrass Lake, Lake Washington, Lake Winder, Lake Poinsett, and Puzzle Lake. The conversion of the flood plain in the USJR basin from wetlands to agricultural and urban land uses has altered the natural hydrology of the region and associated pollutant loading from these converted areas affected water quality in the basin. WBID 2893X is a Class I waterbody, with a designated use of potable water supplies.

#### Discussion of how the load was derived

WBID 2893X was verified as impaired for DO based on assessment methodologies identified in Florida's Impaired Waters Rule (IWR) at Chapter 62-303, F.A.C. Consequently, WBID 2893X was added to the verified list of impaired waters by Secretarial Order on June 17, 2005. The DO impairment in WBID 2893X was based on 17 of the 34 DO measurements being below the 5.0 mg/L state water quality criterion. FDEP identified Biochemical Oxygen Demand (BOD) as the causative pollutant for the DO impairment in WBID 2893X because the median BOD exceeded the 2.0 mg/L screening value for streams. To address the DO impairment in WBID 2893X, FDEP developed a TMDL dated April 25, 2005, which was approved by EPA on January 3, 2007. The Nutrient and DO TMDL for the St. Johns River above Sawgrass Lake (WBID 2893X) adopted at 62-304.510(3) was a TP loading of 57 tons/yr, not to be exceeded as an annual load.

FDEP found that the distribution of DO and BOD throughout the USJR basin and the inverse relationship between DO and TP suggest that anthropogenic BOD and phosphorus are at least partial contributors to the system's low DO concentrations and consequential impaired status. As a result of these analyses, FDEP calculated explicit TMDL TP and BOD loads for these waterbodies.

The TMDL utilized TP and DO as target parameters, with an additional BOD target for WBIDs 2893L and 2893X. The TP target concentration of 0.09 mg/L used in this TMDL was based upon the target TP concentration established for the river channel and chain of lakes in the USJR basin by the St. Johns River Water Management District (SJRWMD). This TP target was set at a level above which total biovolume of blue-green algae substantially increased. Such increased levels of blue-green algae indicate imbalance in flora and fauna. SJRWMD determined that a blue-green algae-based TP target was superior to both chlorophyll-*a* (chl-*a*) and Trophic State Index (TSI) as indicators of the nutrient target because the algae-based target is more sensitive and therefore allows a higher level of protection. According to SJRWMD, blue-green algal blooms could occur in USRJ before a chl-*a* based indicator would detect them.

To determine the annual TP load of the TMDL, FDEP calculated TP and BOD existing loads. Monthly TP loadings to these WBIDs were calculated by multiplying monthly TP concentrations by average monthly flows. These monthly loads were calculated for different years from 1995-2002, then aggregated first by month to represent long-term monthly loads, then overall to calculate long-term annual TP loads for each WBID.

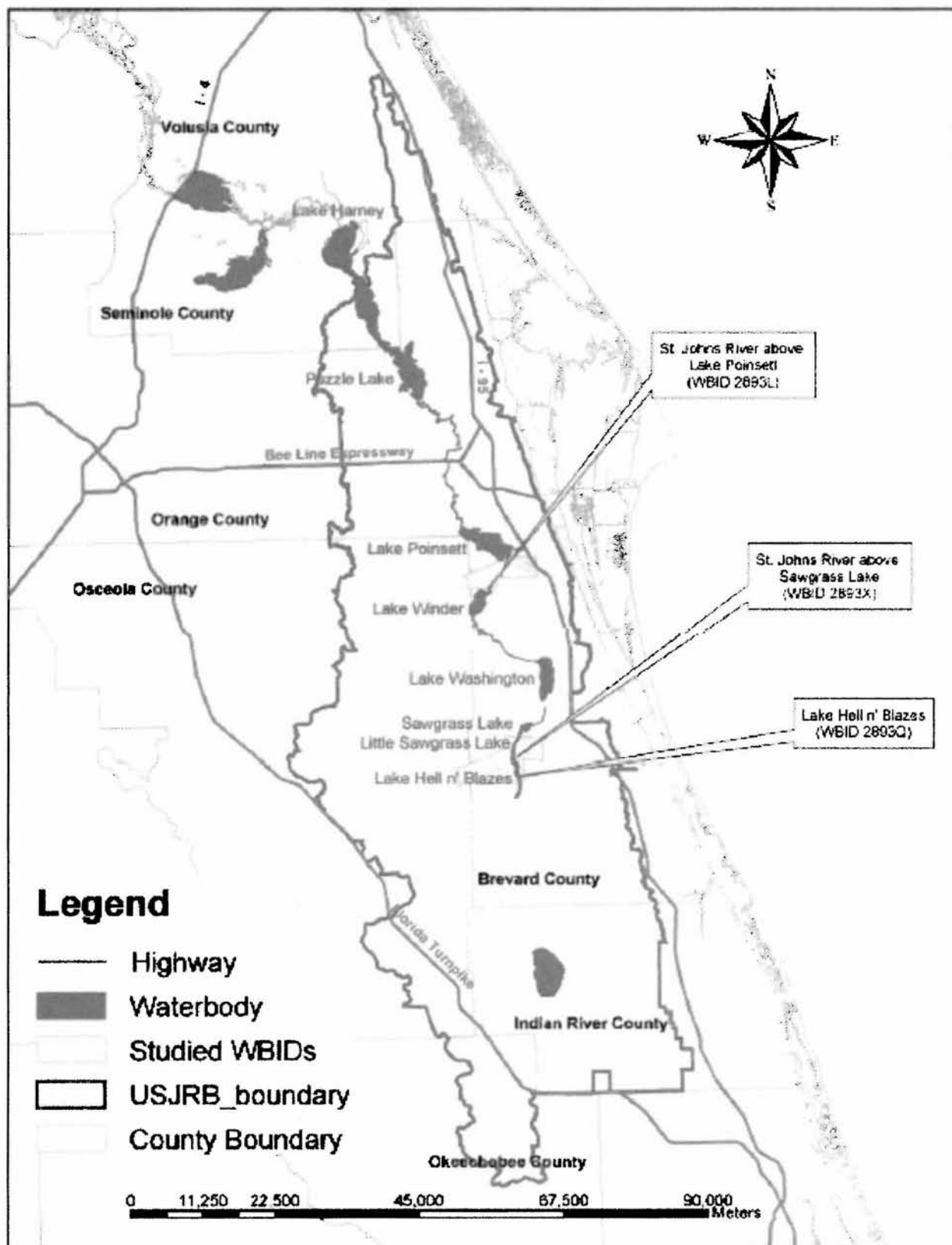
#### Consideration of TMDL load as a new or revised water quality standard

The TMDL load for the St. Johns River above Sawgrass Lake of 57 tons/yr of TP correlated to a TP concentration of 0.09 mg/L. This TP concentration was based upon the concentration established for the river channel and chain of lakes in the USJR basin by SJRWMD which would maintain a balance of flora and fauna and prevent an unbalanced increase of total blue-green algae.

#### Conclusion

Based on the chemical, physical and biological data presented in the development of the SSAC, the EPA concludes that the SSAC for TP established for the USJR WBID 2893X protects healthy, well-balanced biological communities in the waters to which the SSAC applies and is consistent with the CWA and its implementing regulations. More specifically, the SSAC is consistent with both 40 CFR Part 131.11(b)(1)(ii), and the EPA's 304(a) guidance on nutrient criteria. The TP SSAC for St. Johns River above Sawgrass Lake WBID 2893X which provides for TP loading of 57 tons/yr, will protect water quality and aquatic life. FDEP did not address downstream protection in this TMDL. Paragraph 62-302.531(4) will apply to this WBID in conjunction with the Hierarchy 1 SSAC to ensure attainment and maintenance of water quality standards of downstream waters, in accordance with 40 CFR Part 131.10. In accordance with section 303(c) of the CWA, the SSAC for the St. Johns River above Sawgrass Lake for TP loading of 57 tons/yr, not to be exceeded as an annual load, is hereby approved as consistent with the CWA and 40 CFR Part 131.





Overview of waters included in this TMDL (p. 2, Figure 1.1)

### Appendix 1 – Summary of the TMDL Background

|   |  |
|---|--|
| <b>Name(s) of Addressed Water(s)</b>  | St. Johns River above Sawgrass Lake  |
| <b>Waterbody Type(s)</b>  | Stream (IWR Run 40)  |
| <b>WBIDs</b>  | 2893X  |
| <b>Latitude/Longitude</b>   | NA.  |
| <b>Description</b>  | Segment of the USJR. The USJR basin extends from the southern boundary of Indian River County and the middle of Okeechobee County in the south to the confluence with the Econlockhatchee River near Lake Harney (Seminole County) in the north and southeast part of Volusia County in the northeast. The USJR flows from south to north and drains a watershed area of about 1,209,000 acres. The movement of the water in the first 30 miles (headwater area) of the river is dominated by sheet flow until reaching the discernible channel at the Three Forks Marsh area. The river then flows northward through about 90 miles of river channel and seven major lakes including Lake Hell n' Blazes, Little Sawgrass Lake, Sawgrass Lake, Lake Washington, Lake Winder, Lake Poinsett, and Puzzle Lake (TMDL p. 1). WBID 2893X is in Brevard County with WBID 2893Q upstream of this segment to the south (TMDL p. 2). |
| <b>Classification(s)</b>  | Class I (TMDL p. 12)   |
| <b>Basin</b>  | Upper St. Johns River (TMDL p. 1)  |
| <b>Date Placed on Verified List</b>   | June 17, 2005 (TMDL, p. 1)   |
| <b>Date TMDL was approved by EPA</b>  | January 3, 2007 (EPA WATERS database query 6/4/12)   |
| <b>Reference Streams/Lakes</b>  | NA.  |
| <b>Source of Majority of Flow</b>   | Not specified, part of USJR system. The long-term average flow for WBID 2893X was estimated to be 513,141 acre-ft-yr (TMDL p. 34).   |
| <b>Indicators</b>   | Total biovolume of blue-green algae substantially increased when the TP concentration was greater than 0.09 mg/L. The increase of blue-green algae in the phytoplankton community can significantly disrupt the normal functions of phytoplankton communities, which leads to an imbalance of aquatic flora and fauna (TMDL p. 12, 13, 24).  |
| <b>Identification of Causative Pollutants (as determined by measurements of response endpoints or indicators)</b> | <p>Median BOD concentrations in WBID 2893X (2.8 mg/L) were higher than 2.0 mg/L, which is the screening level used by FDEP, and was therefore considered by FDEP as a causative pollutant for the low DO condition (TMDL p. 8, 20).</p> <p>The TN/TP ratio was between 10 and 30, in most cases just slightly higher than 10, indicating TN/TP co-limitation or communities more limited by nitrogen than phosphorus. FDEP suggests that</p>   |

|  |   |  |  |
|--|---|--|--|
|  | <p>reductions in phosphorus input will return community to a TP limited community and also reduce nitrogen loading throughout the USJR basin (TMDL p. 13).</p>  |  |  |
| <b>Sources and Concentrations of Nutrient Enrichment</b> | <p>The majority of TP and BOD loadings to the USJR basin come from nonpoint sources including surface runoff, groundwater input, nutrient sediment release, and atmospheric deposition. Agriculture is the dominant land use, at 43 percent of the overall area of the basin, followed by wetlands at 29 percent (TMDL p. 27). It was estimated that surface runoff from agricultural lands accounts for 73.4 percent of the total contributions from surface runoff (TMDL p. 30).</p> <p>Eight NPDES permitted facilities discharge in the parts of the USJR basin that discharge to the three WBIDs covered by this TMDL. Of these eight, the only facility discharging significant TP and BOD loading is the BCUD/South Central Regional WWTF but it is located downstream of WBID 2893Q and does not impact this WBID (TMDL p. 26).</p> <p>Within the USJR basin Municipal Separate Storm Sewer Systems (MS4) Phase I permit holders include Seminole County, Orange County, and Department of Transportation within Seminole and Orange County. Other counties within the basin have Phase II MS4 permits including Volusia, Osceola, Brevard, Indian River, and Okeechobee counties (TMDL p. 27).</p> |  |  |
| <b>Nutrient Watershed Region in Proposed 62.302</b>      | <p>Peninsular Stream (IWR Run 40)</p>   |  |  |
| <b>Proposed Nitrogen SSAC and Frequency</b>              | <p>NA.</p>  |  |  |
| <b>Proposed Phosphorus SSAC and Frequency</b>            | <p>57 tons/yr annual load in WBID 2893X (TMDL p. 35, 38).</p>   |  |  |
| <b>Biological Index Score(s) (e.g., SCI, TSI, IBI)</b>   | <p>NA.</p>  |  |  |